

REMARKS

Applicants respectfully request reconsideration of this application, and reconsideration of Paper No. 7. Upon entry of this Amendment and Request for Reconsideration, claims 11-14 will remain pending in this application.

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Claim 14 is amended hereby. This is only to correct a typing error in the original claim. This amendment was not motivated by the instant rejections to the claims, or necessary to address such rejections.

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Claims 11-14 are rejected under the judicially created doctrine of obviousness-type double patenting as purportedly obvious based on claims 1-8 of U.S. Patent No. 6,355,109.

Applicants submit herewith a Terminal Disclaimer signed by Applicants' representative. The Terminal Disclaimer overcomes this rejection. Hence, withdrawal of the rejection is respectfully requested.

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Claims 11-14 are also rejected under 35 U.S.C. § 103(a) as purportedly obvious based on Van Os et al. (U.S. Pat. No. 5,792,272) in view of Shinjiro (U.S. Pat. No. 4,768,921). Applicants respectfully traverse.

The Office Action asserts that Van Os discloses each element of the claimed invention except the specific structure of the vacuum pump. The Office Action further asserts that Shinjiro discloses a turbomolecular pump. The Office Action thus concludes that it would have been obvious to one of ordinary skill in the art to modify the invention of Van Os by employing the turbomolecular pump disclosed by Shinjiro.

The present invention concerns a vacuum processing apparatus for applying a designated process on an object to be processed in a vacuum atmosphere. The apparatus, as described in claims 11 and 12, includes a toroidal shaped vacuum pump. The toroidal shaped vacuum pump is

arranged below the processing vessel and coaxial with the susceptor. The toroidal shaped vacuum pump defines a column-shaped space that is surrounded by the vacuum pump and is located below the susceptor. The apparatus of claim 13 similarly includes an exhaust means that is arranged below the processing vessel and coaxial with the susceptor. The exhaust means defines a column-shaped space that likewise is surrounded by the exhaust means and that is located below the susceptor. The apparatus of claim 14 includes a vacuum pump constructed cylindrically as a whole and arranged below the susceptor in the processing vessel so as to be coaxial with the processing vessel. The vacuum pump includes a cylindrical inner housing arranged coaxially with the processing vessel, a cylindrical motor stator arranged outside the cylindrical inner housing, a number of rotors rotatably arranged with respect to the cylindrical motor stator, a cylindrical outer housing arranged outside the rotors, and a number of stators fixed to the cylindrical outer housing so as to each extend between the adjacent rotors.

Because of its configuration, Applicants' device, as defined in each of claims 11-14, makes it possible to locate a toroidal shaped vacuum pump or the like in such a way that the toroidal pump surrounds the driving mechanism along the outer surface of the driving mechanism. Therefore, the vacuum pump and the driving mechanism are confined to a space under the processing vessel. Applicants' claimed structure, in plan view, prevents the vacuum pump from protruding from the outside surface of the processing vessel. Consequently, Applicants' structure minimizes the size of the apparatus, in plan view, as well as minimizes the space required for installing the apparatus. In contrast, neither Van Os nor Shinjiro discloses an apparatus having a driving mechanism that is received in the columned space surrounded by a toroidal vacuum pump.

Van Os fails to disclose that the driving mechanism is arranged below the susceptor. In contrast, the susceptor 20 in Van Os is mounted to the process chamber 16 with the (laterally-oriented) arm 21 and the plate 29. Moreover, the Office Action concedes that Van Os fails to teach or fairly suggest the pump as claimed by Applicant. Applicant respectfully urges that Shinjiro fails to remedy this deficiency of Van Os. Shinjiro fails to disclose a toroidal shaped

vacuum pump including a motor therein. The vacuum pump disclosed in Shinjiro does not have a toroidal shape.

As discussed above, neither Van Os nor Shinjiro discloses each and every element of the vacuum pump as claimed. Hence, the combination of the prior art documents fails to teach or fairly suggest each and every element of the claimed invention and thus cannot render the claimed invention obvious.

The above remarks overcome this rejection. Hence, reconsideration and withdrawal of the rejection are respectfully requested.

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Applicants respectfully submit that the Terminal Disclaimer and the above Remarks obviate the outstanding rejections in this case, thereby placing the application in condition for immediate allowance. Allowance of this application is earnestly solicited.


If any fees under 37 C.F.R. §§ 1.16 or 1.17 are due in connection with this filing, please charge the fees to Deposit Account No. 02-4300; Order No. 033082.0231.

If an extension of time under 37 C.F.R. § 1.136 is necessary that is not accounted for in the papers filed herewith, such an extension is requested. The extension fee should be charged to Deposit Account No. 02-4300; Order No. 033082.0231.

Respectfully submitted,

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MARKED-UP PREVIOUS VERSION OF THE AMENDED CLAIM

14. (Amended) A vacuum processing apparatus for applying a designated process on an object to be processed in a vacuum atmosphere, comprising:

a processing vessel for applying the designated process on the object introduced thereinto, the processing vessel being provided, therein, with a susceptor for mounting the object thereon;

a vacuum pump constructed cylindricall.y as a whole and arranged below the susceptor in the processing vessel so as to be coaxial with the processing vessel, for sucking exhaust gas in the processing vessel thereby to form a vacuum, the vacuum pump including:

a cylindrical inner housing arranged coaxially with the processing vessel,

a cylindrical motor stator arranged outside the cylindrical inner housing,

a number of rotors rotatably arranged with respect to the cylindrical motor stator,

a cylindrical [inner] outer housing arranged outside the rotors, and

a number of stators fixed to the cylindrical outer housing so as to each extend between the adjacent rotors; and

a driving mechanism arranged below the susceptor, for moving it up and down, wherein the vacuum pump is arranged around at least a portion of the driving mechanism coaxially therewith.